

IEEE 802.11g PCI Adapter

User's Guide

Regulatory notes and statements

Wireless LAN, Health and Authorization for use

Radio frequency electromagnetic energy is emitted from Wireless LAN devices. The energy levels of these emissions however are far much less than the electromagnetic energy emissions from wireless devices like for example mobile phones. Wireless LAN devices are safe for use frequency safety standards and recommendations. The use of Wireless LAN devices may be restricted in some situations or environments for example:

- On board of airplanes, or
- In an explosive environment, or
- In case the interference risk to other devices or services is perceived or identified as harmful

In case the policy regarding the use of Wireless LAN devices in specific organizations or environments (e.g. airports, hospitals, chemical/oil/gas industrial plants, private buildings etc.) is not clear, please ask for authorization to use these devices prior to operating the equipment.

Regulatory Information/disclaimers

Installation and use of this Wireless LAN device must be in strict accordance with the instructions included in the user documentation provided with the product. Any changes or modifications made to this device that are not expressly approved by the manufacturer may void the user's authority to operate the equipment. The Manufacturer is not responsible for any radio or television interference caused by unauthorized modification of this device, of the substitution or attachment. Manufacturer and its authorized resellers or distributors will assume no liability for any damage or violation of government regulations arising from failing to comply with these guidelines.

USA-FCC (Federal Communications Commission) statement

This device complies with Part 15 of FCC Rules.

Operation is subject to the following two conditions:

1. This device may not cause interference, and
2. This device must accept any interference, including interference that may cause undesired operation of this device.

FCC Radio Frequency Exposure statement

This Wireless LAN radio device has been evaluated under FCC Bulletin OET 65 and found compliant to the requirements as set forth in CFR 47 Sections 2.1091, 2.1093, and 15.247 (b) (4) addressing RF Exposure from radio frequency devices.

The radiated output power of this Wireless LAN device is far below the FCC radio frequency exposure limits. Nevertheless, this device shall be used in such a manner that the potential for human contact during normal operation is minimized.

When nearby persons has to be kept to ensure RF exposure compliance, in order to comply with RF exposure limits established in the ANSI C95.1 standards, the distance between the antennas and the user should not be less than 20 cm.

FCC Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with the instructions, it may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

1. Reorient or relocate the receiving antenna.
2. Increase the distance between the equipment and the receiver.
3. Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
4. Consult the dealer or an experienced radio/TV technician for help.

Export restrictions

This product or software contains encryption code that may not be exported or transferred from the US of Canada without an approved US Department of Commerce export license.

Safety Information

Your device contains a low power transmitter. When device is transmitted it sends out radio frequency (RF) signal.

CAUTION: To maintain compliance with FCC's RF exposure guidelines, this equipment should be installed and operated with minimum distance 20cm between the radiator and your body. Use on the supplied antenna. Unauthorized antenna, modification, or attachments could damage the transmitter and may violate FCC regulations.

The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

CE Mark Warning

This is a Class B product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

Protection requirements for health and safety – Article 3.1a

Testing for electric safety according to EN 60950 has been conducted. These are considered relevant and sufficient.

Protection requirements for electromagnetic compatibility – Article 3.1b

Testing for electromagnetic compatibility according to EN 301 489-1, EN 301 489-17 and EN 55024 has been conducted. These are considered relevant and sufficient.

Effective use of the radio spectrum – Article 3.2

Testing for radio test suites according to EN 300 328-2 has been conducted. These are considered relevant and sufficient.

CE in which Countries where the product may be used freely:

Germany, UK, Italy, Spain, Belgium, Netherlands, Portugal, Greece, Ireland, Denmark, Luxembourg, Austria, Finland, Sweden, Norway and Iceland.

France: except the channel 10 through 13, law prohibits the use of other channels.



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INTRODUCTION

Congratulations on your purchase of this IEEE 802.11g Wireless PCI Adapter. This manual helps to get familiar with the Wireless PCI Adapter. This manual contains detailed instructions in operation of this product. Please keep this manual for future reference.

With a Wireless (IEEE 802.11g) PCI Adapter, a computer or a station can communicate with another computer in a wireless way. Easy-to-use utilities are bundled with Wireless PCI Adapter for configuration, monitoring, and diagnosis purposes.

Wireless PCI Adapter can wirelessly transmit and receive data, minimizing the need for wired connections, at a speed of up to fifty-four megabit per second. With Wireless PCI Adapter, you can locate your PC or station wherever you want without wires and cables.

Wireless PCI Adapter provides users with an access to real-time information anywhere in their organization. The mobility provides productivity and service, which are not available under wired networks. The Wireless PCI Adapter configuration is easy to change from peer-to-peer networks, suitable for a small number of users, to full infrastructure networks of thousands of users that allow roaming around a broad area.

Overview of this User's Guide

Introduction. Describes the Wireless PCI Adapter.

Unpacking and Setup. Helps you get started with the basic installation of the Wireless PCI Adapter.

Hardware Installation. Describes the LED indicators of the Adapter.

Software Installation. Tells how to setup the driver and the utility setting.

Technical Specifications. Lists the technical (general, physical and environmental) specifications of the Wireless PCI Adapter.

UNPACKING AND SETUP

This chapter provides unpacking and setup information for the Wireless PCI Adapter.

Unpacking

Open the box of the Wireless PCI Adapter and carefully unpack it. The box should contain the following items:

- ◆ One 802.11g Wireless PCI Adapter
- ◆ One Driver & Utility CD-ROM

If any item is found missing or damaged, please contact your local reseller for replacement.

Setup

The setup of the Wireless PCI Adapter can be performed using the following steps:

- ◆ Visually inspect the PCI Adapter and make sure that it is fully plugged in to the PC's PCI slot.
- ◆ Make sure that there is a well environment that there is no much intrusion to have a better connection.

HARDWARE INSTALLATION

LED Indicator

LNK (Link)

The LNK indicator indicates green when the Wireless PCI Adapter is connected to a network successfully.

ACT (Activity)

The ACT indicator blinks green continuously while the Wireless PCI Adapter is transmitting data.

Check the installation

1. Shut down the computer, unplug its power cord, and remove the chassis cover.
2. Insert the contact edge of the Wireless PCI Adapter into the connector of any available PCI Bus Master Expansion slot. Press the card firmly into the connector such that the card's contacts are fully seated in the PCI slot connector.
3. Install the bracket screw and secure the card to the computer chassis.
4. Cover the computer's chassis.
5. Switch computer power on. The computer will automatically activate the newly installed driver and utility for the Wireless PCI Adapter.

SOFTWARE INSTALLATION

This section will lead you to install the driver and utility of the Wireless Cardbus Adapter.

Windows 98se/ME/2000/XP Utility and Driver Installation

1. Insert the Wireless Cardbus Adapter Driver & Utility CD-ROM into computer's CD-ROM Drive and it will automatically run a setup menu and install the driver and the utility. In some specific setting on Windows system, you may need to proceed the software manually, go to your Windows Start menu and choose **Run**, type "D:\Utility\Setup.exe" in the dialog box (D:\ will depend on where your CD-ROM drive is located) and click **OK**.
2. If you need to install the driver manually, refer each Windows OS to the following CD-Rom directory path: D:\Driver\<Windows OS>\net5211.inf.

Note: (D:\ will depends on where the CD-ROM drive is located and <Windows OS> will depend on the Windows OS you are using).



3. The Install Shield Wizard screen will appear. Click "**Next**" to continue.
4. The installation program will help you to setup the Wireless Cardbus utility.
Be noted that the Windows XP have its own Wireless Utility; you can either use the utility of Windows XP or the provided utility.
5. When the Wireless Cardbus Adapter was installed, you will see the icon on the Windows task bar.

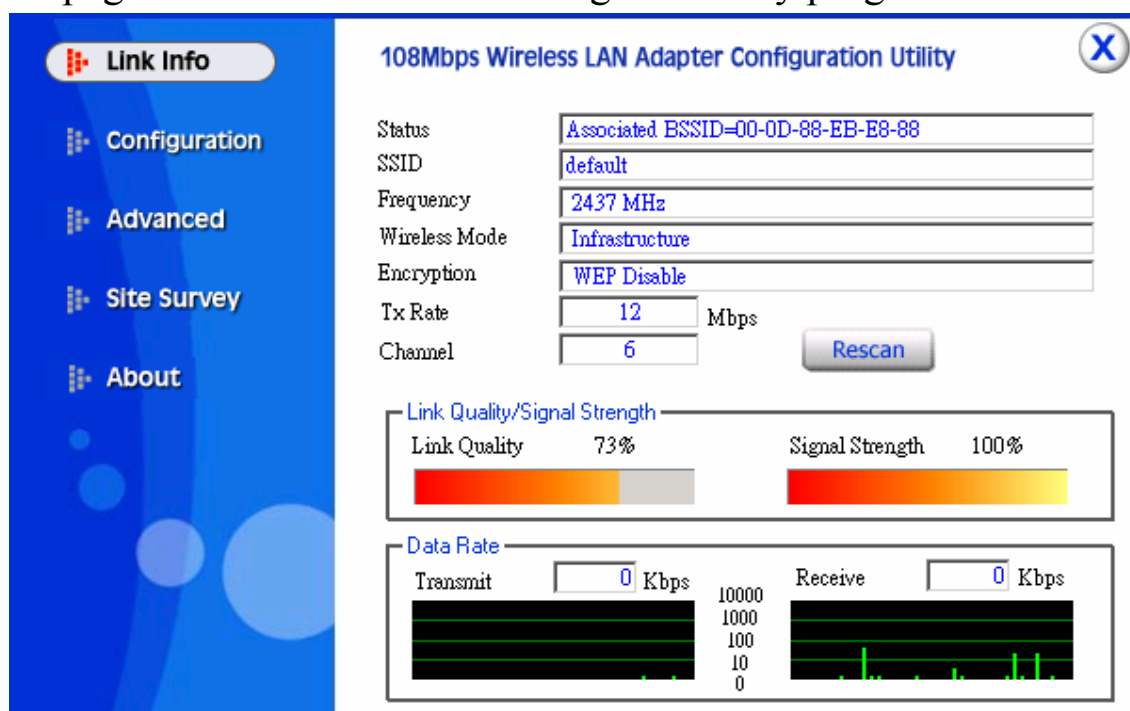


When the icon in the toolbar represents in full green color then the signal strength has an excellent performance with the AP, if it represents in yellow color then the signal strength has a fair performance with the AP, and if the icon represents no color, then the signal strength has a worst performance with the wireless station.

Wireless Utility Setting

I. Link Information

The default page is as below after launching the Utility program.



Status: Shows the BSSID associated, which can be used to identify the wireless network.

SSID: Shows current SSID, which must be the same for the wireless client and AP in order for communication to be established.

Frequency: Shows the current frequency used for wireless network.

Wireless Mode: Shows the current wireless mode used for wireless communication.

Encryption: Shows the current encryption mode used for wireless network.

TxRate: Shows the current data rate used for transmitting.

Channel: Shows the current channel for communication.

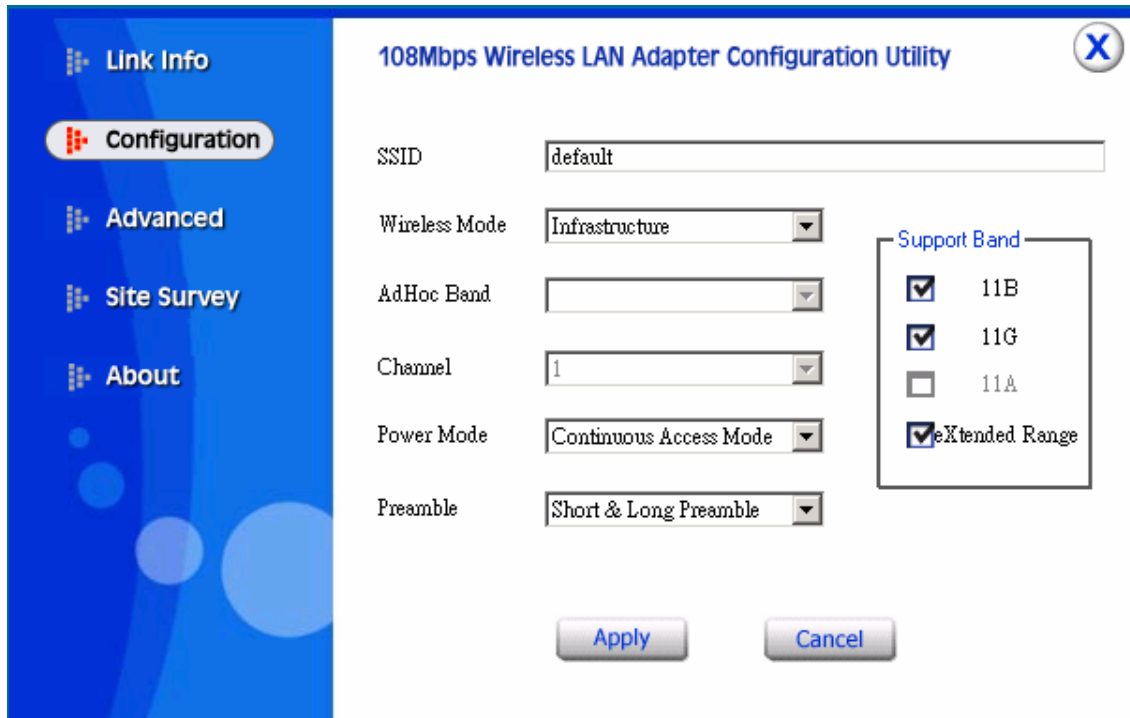
Link Quality: Shows the link quality of the 108Mbps wireless LAN PC card with the Access Point when operating under Infrastructure mode.

Signal Strength: Shows the wireless signal strength of the connection between the 108Mbps wireless LAN PC card with the Access Point.

Data Rate: Shows the statistics of data transfer, and the calculation is based on the number of packets transmitted and received.

II. Configuration

This is the page where changes the basic settings of the PC card with the minimum amount of effort to implement a secure wireless network environment.



SSID: Service Set Identifier, which is a unique name shared among all clients and nodes in a wireless network. The SSID must be identical for each clients and nodes in the wireless network.

Wireless Mode: There are two types available for selection

- Infrastructure – to establish wireless communication with LAN and other wireless clients through the use the Access Points.
- Ad-Hoc – to establish point-to-point wireless communication directly with other wireless client devices such as wireless network PCI Adapter.

AdHoc Band: There are two bands available for selection- 11B and 11G

Channel: The value of channel that AP will operate in. User can select the channel range of 1 to 11 for North America (FCC) domain and 1 to 13 for European (ETSI) domain and 1 to 14 for Japanese domain.

Tx Rate: Select the data rate for data transmission.

Power Mode: There are 3 modes to choose.

- Continuous Access Mode (default) – the PC card is constantly operating with full power and it consumes the most power.
- Maximum Power Save – the PC card consumes the least power and only operates when there is wireless network activity.
- Power Save – the PC card consumes the moderate level of power.

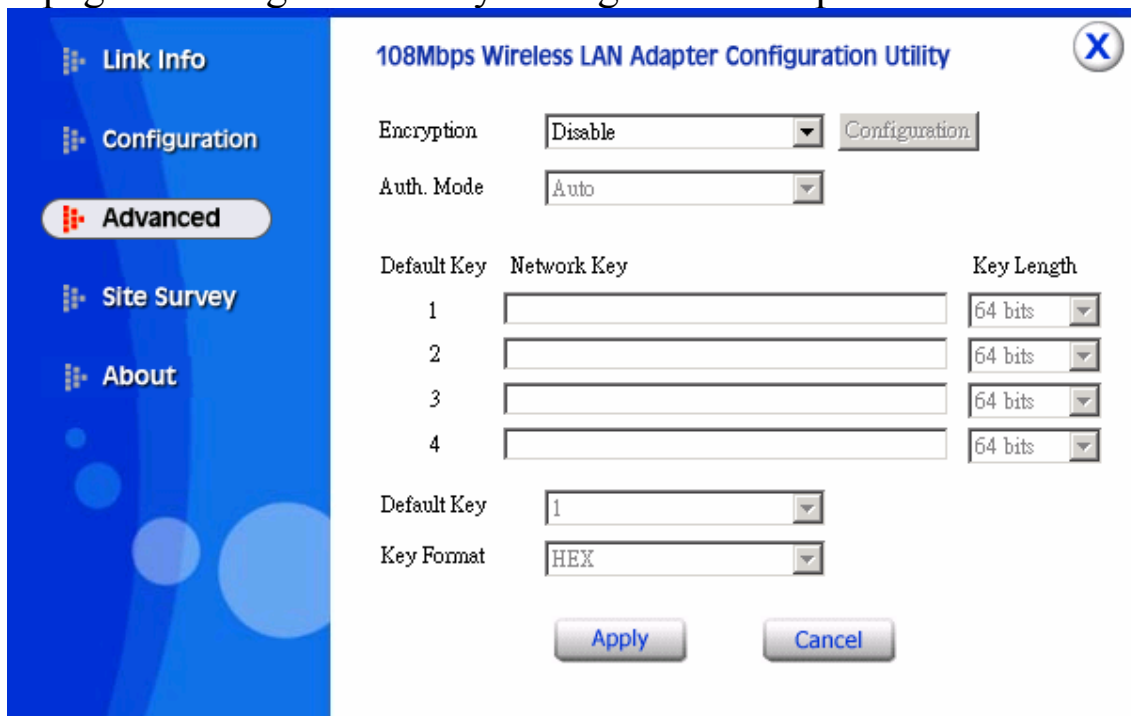
Preamble: Select Long or Short Preamble type. Preamble is a sequence of bits transmitted at 1Mbps that allows the PHY circuitry to reach steady-state demodulation and synchronization of bit clock and frame start. Two different preambles and headers are defined: the mandatory supported Long Preamble and header, which interoperate with the 1 Mbit/s and 2 Mbit/s DSSS specification (as described in IEEE Std 802.11), and an optional Short Preamble and header (as described in IEEE Std 802.11b). At the receiver, the Preamble and header are processed to aid in demodulation and delivery of the PSDU. The Short Preamble and header may be used to minimize overhead and, thus, maximize the network data throughput. However, the Short Preamble is supported only from the IEEE 802.11b (High- Rate) standard and not from the original IEEE 802.11. That means that stations using Short-Preamble cannot communicate with stations implementing the original version of the protocol. Click “Apply” for the changes to take effect.

Support Band: There are three functions for users select, including 11B, 11G and eXtended Range. The default setting is 11B, 11G and eXtended Range enable, which is interoperable with both 11B and 11G devices, and provide more than 500m connection ability.

Note: user must select one of 11B or 11G at least, otherwise the wireless connection will not function.

III. Advanced

This is the page to configure Security settings of 108Mbps wireless LAN PC card.

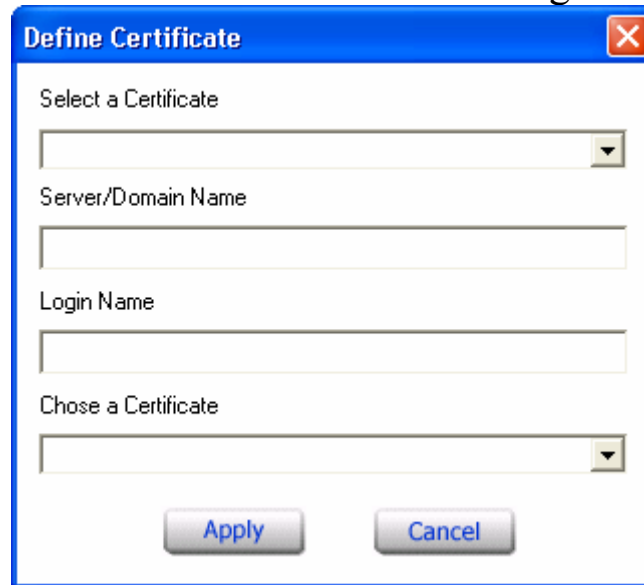


The screenshot shows the '108Mbps Wireless LAN Adapter Configuration Utility' window. On the left is a blue sidebar with navigation links: 'Link Info', 'Configuration', 'Advanced' (highlighted), 'Site Survey', and 'About'. The main window has a title bar and a close button. It contains the following settings:

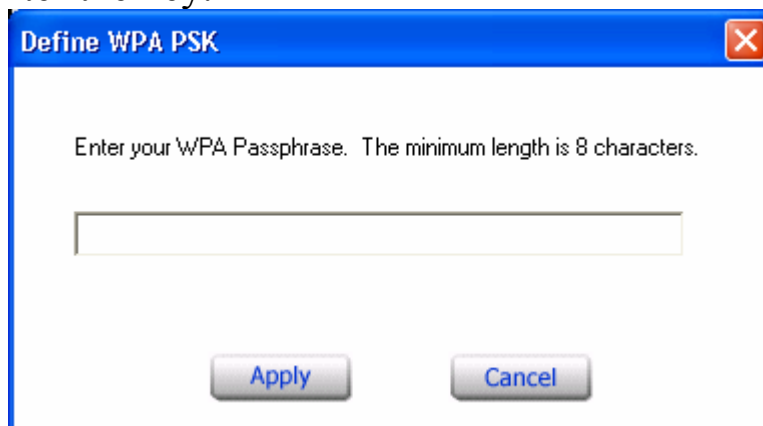
- Encryption:** A dropdown menu set to 'Disable' and a 'Configuration...' button.
- Auth. Mode:** A dropdown menu set to 'Auto'.
- Default Key / Network Key / Key Length:** A table with 4 rows. Each row has a 'Default Key' (numbered 1-4), a 'Network Key' (text input), and a 'Key Length' (dropdown set to '64 bits').
- Default Key:** A dropdown menu set to '1'.
- Key Format:** A dropdown menu set to 'HEX'.
- Buttons:** 'Apply' and 'Cancel' buttons at the bottom.

Encryption: 4 options are available: **Disable**, **Enable**, **WPA** and **WPA-PSK**. Select **Enable** or **Disable** for WEP data encryption feature. If one of the two

options is selected, it is required to select the **Authentication mode** from the next dropping list. If **WPA** is selected, configuration is enabled. Please click the “**configuration**”. The below window is pop up. Then, please select the certificate that user wants to use and enter the server name and login name

A dialog box titled "Define Certificate" with a blue header bar and a red close button. It contains four input fields: "Select a Certificate" (a dropdown menu), "Server/Domain Name" (a text box), "Login Name" (a text box), and "Chose a Certificate" (a dropdown menu). At the bottom are "Apply" and "Cancel" buttons.

If WPA-PSK is selected, click the configuration button. The popping window is as the below. Please enter the key.

A dialog box titled "Define WPA PSK" with a blue header bar and a red close button. It contains a single text input field with the placeholder text "Enter your WPA Passphrase. The minimum length is 8 characters." At the bottom are "Apply" and "Cancel" buttons.

Auth. Mode: There are three modes available to choose.

- **Open Authentication** – the sender and receiver do not share secret Key for communication. Instead, each party generates its own key-pairs and asks the other party to accept it. The key is regenerated when the connection is established every time.

- **Shared Authentication** – the sender and receiver shares the common key for data communication, and the key is used for extended length of time.

- **Auto** – depend on the communication to establish, and automatically use the proper authentication mode.

The following will only be activated to allow for configuration when **Encryption** is enabled.

Default Key: select one of the 4 keys to use.

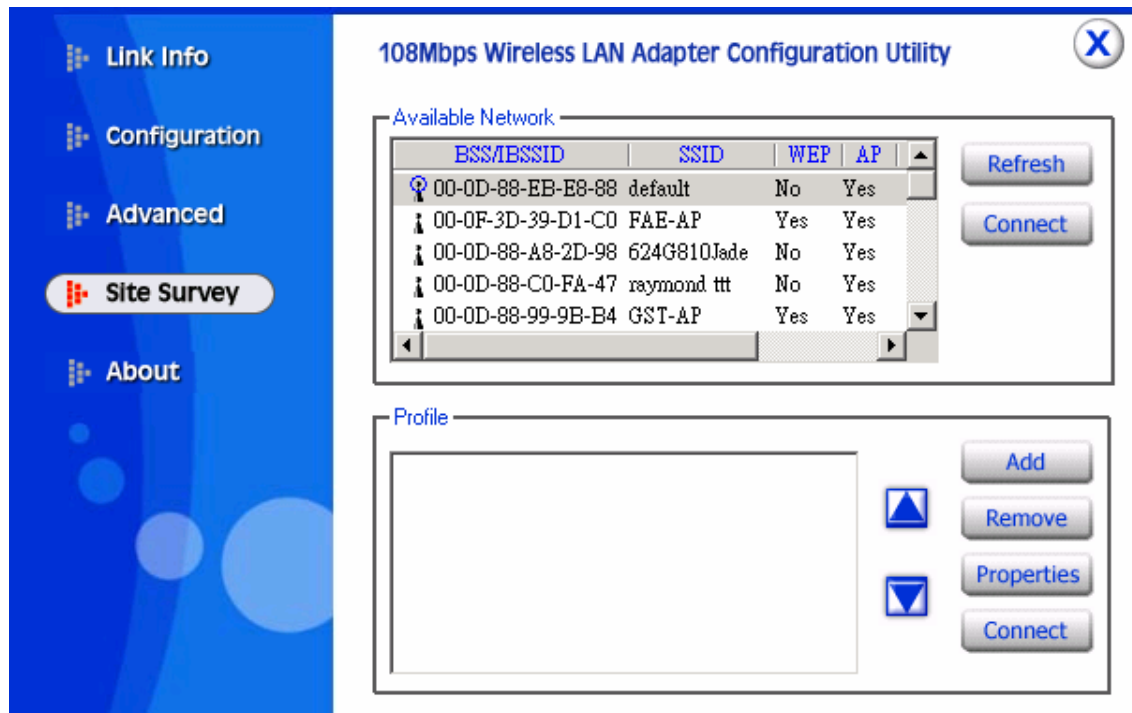
Network Key: choose the encryption way, either in HEX or ASCII formats, and enter the password in the blank space.

Key Length: select 64 or 128 bits as the length of the keys

Key Format: ASCII or HEX

IV. Site Survey

This page allows user to enable the Site Survey function to scan for the available wireless network (wireless clients and Access Points) and establish wireless communications with one.



Available Network – displays the wireless networks (wireless clients and Access Points) that are in signal range.

Select any one of them to establish communications by simply mouse **double-click** or click on the “**Connect**” button.

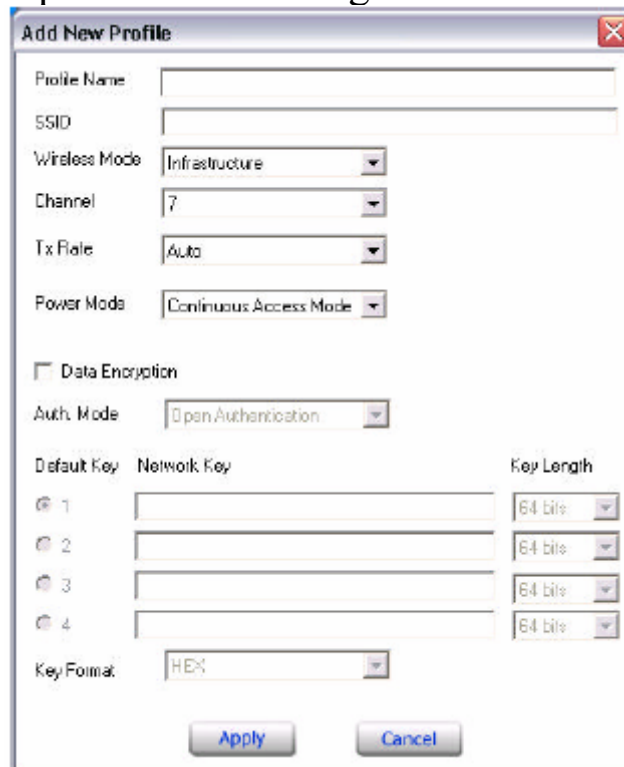
Click “**Refresh**” button to start scanning for available network again.

Profile – User can create and manage the created profiles for Home, offices or public areas. By double-clicking on one of the created profile, the setting will adapt to the configuration such as SSID, channel, and WEP settings saved by that particular profile.

Remove: To remove the selected the profile

Properties: To view and change its settings of the profile.

Add: To add a profile. Then, the following screen would appear. User can enter the necessary information required for accessing Access Points or Wireless Router.

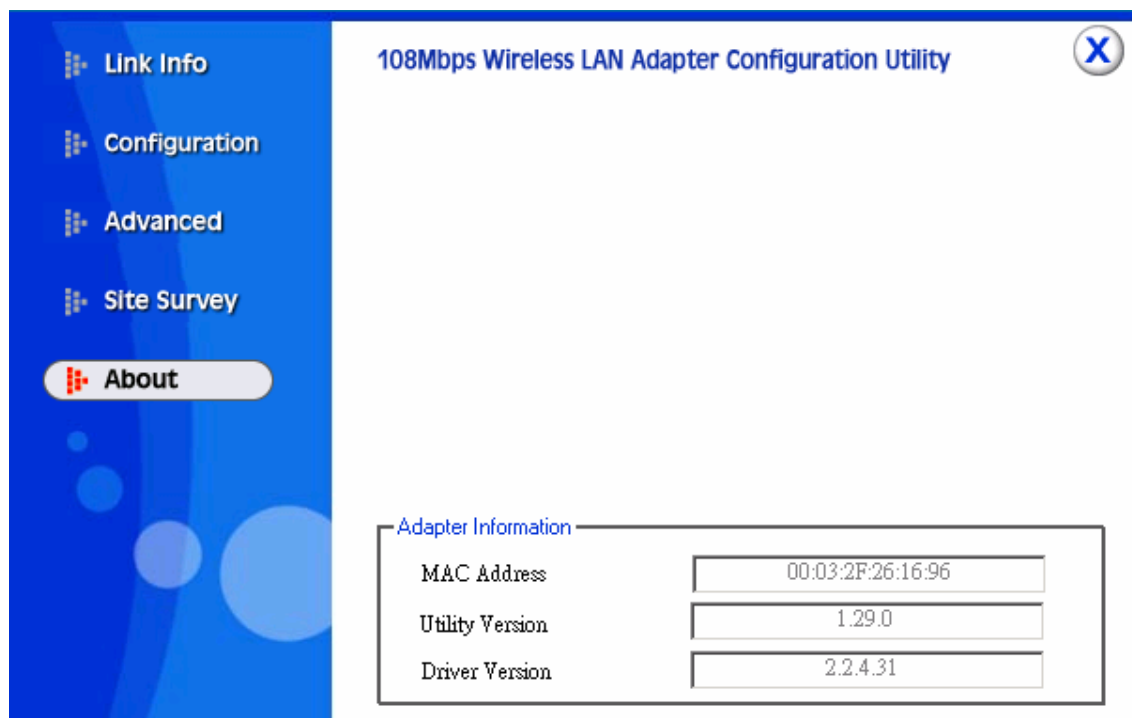


The 'Add New Profile' dialog box contains the following fields and controls:

- Profile Name: Text input field
- SSID: Text input field
- Wireless Mode: Dropdown menu (selected: Infrastructure)
- Channel: Dropdown menu (selected: 7)
- Tx Rate: Dropdown menu (selected: Auto)
- Power Mode: Dropdown menu (selected: Continuous Access Mode)
- Data Encryption: Unchecked checkbox
- Auth. Mode: Dropdown menu (selected: Open Authentication)
- Default Key: Radio buttons 1, 2, 3, 4
- Network Key: Text input field (associated with selected key)
- Key Length: Dropdown menu (selected: 64 bits)
- Key Format: Dropdown menu (selected: HEX)
- Buttons: Apply, Cancel

V. About

This page displays some information about the 108Mbps wireless LAN PC card utility, which includes the version numbers for Driver, Firmware and Utility. When there is new version of software available for upgrade, users will be able to identify by version numbers.



The 'About' screen of the '108Mbps Wireless LAN Adapter Configuration Utility' features a blue sidebar with navigation links: Link Info, Configuration, Advanced, Site Survey, and About (highlighted). The main content area displays the following information:

Adapter Information	
MAC Address	00:03:2F:26:16:96
Utility Version	1.29.0
Driver Version	2.2.4.31

TECHNICAL SPECIFICATIONS

General	
Radio Technology	IEEE 802.11b Direct Sequence Spread Spectrum (DSSS) IEEE 802.11g Orthogonal Frequency Division Multiplexing (OFDM)
Interface	32-bit PCI 2.1, 2.2. Bus Master
Data Transfer Rate	1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, 54Mbps (auto sense)
Receiver Sensitivity	54Mbps: Typical -73dBm @ 10% PER (Packet Error Rate) 11Mbps: Typical -85dBm @ 8% PER (Packet Error Rate)
Transmit Rate	802.11g: 14dBm typically 802.11b: 18dBm typically
Frequency Range	2412 ~ 2484 MHz ISM band (channels 1 ~ 14)
Modulation Schemes	DBPSK/DQPSK/CCK/OFDM
Channels	1~11 channels (FCC), 1~13 channels (ETSI), 1~14 channels (MKK-Japan)
Media Access Protocol	CSMA/CA with ACK
Security	64/128-bits WEP Encryption, WPA
Diagnostic LED	LNK (Link status), ACT (Activity status)
Antenna	2 dBi Dipole Antenna
Physical and Environmental	
Driver Support	Windows 98se, Windows 2000, Windows ME, Windows XP
Continuous Current Consumption	250mA typ. for receive mode, 350mA typ. for transmit mode
Temperature	Operating: 0° ~ 40° C, Storage: -10° ~ 70° C
Humidity	10% ~ 95% RH, no condensation
Dimensions	133 x 121 x 21.6 mm (without antenna)
Certifications	FCC Part 15.247 for US, ETS 300 328 for Europe,